

Janet Richardson Property

City of Annapolis, Maryland

WSSI #MD1213.01

Wetland Delineation Report

February 19, 2016

Prepared for:

Crystal Spring Development, LLC

90 Post Road, 3rd Floor

Westport, Connecticut 06880

Prepared by:



Kenneth R. Wallis

2-19-16

Kenneth R. Wallis Date

1131 Benfield Boulevard, Suite L

Millersville, MD 21108

Tel: 410-672-5990

Email: contactus@wetlandstudies.com

www.wetlandstudies.com

1. INTRODUCTION

A wetland delineation in accordance with the methodologies outlined in the 1987 *Corps of Engineers Wetlands Delineation Manual*¹ and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region*² was conducted by Kenneth R. Wallis and Andie Murtha of Wetland Studies and Solutions, Inc. on November 9, 2015. The purpose of the delineation was to identify any wetlands, streams, or other jurisdictional areas that would be regulated by the Maryland Department of the Environment and/or the U.S. Army Corps of Engineers. The limits of potential jurisdictional areas within the study area were flagged in the field with orange colored surveyors tape and numbered consecutively. Three (3) data sheet were also completed to document the presence or absence of wetlands within the study area (Appendix A).

2. EXISTING SITE CONDITIONS

The 76.10-acre Janet Richardson Property (study area) is located fronting on the west side of Spa Road in the City of Annapolis, Maryland (Figure 1). The study area is bordered to the north, west, and south by private land. The latitude and longitude of the study area are N38°57' 36" and W76°30' 55", respectively.

3. ENVIRONMENTAL MAPS

Various environmental maps were reviewed prior to conducting the wetland delineation in order to obtain knowledge on potential site conditions and characteristics. This information is useful in accurately delineating the limits of jurisdictional areas in the field.

a. NRCS Soil Surveys

The U.S. Department of Agriculture - Natural Resources Conservation Service (NRCS) has produced soil surveys for every county within the State of Maryland. The soil surveys map the locations of the various soil types throughout each county and provide a description of each soil type. The updated soil survey for the City of Annapolis (Figure 2) that can be accessed on-line at <http://websoilsurvey.nrcs.usda.gov> revealed eleven (11) soil types are mapped within the study area (Figure 2). One of the soils on the site, Colemantown fine sandy loam (CkA), has been classified as predominantly hydric by the NRCS. The soil descriptions are listed in Table 1 below.

¹ Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. Wetlands Research Program Technical Report Y-87-1. Final Report. January.

² U.S. Army Corps of Engineers. 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region*. ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

TABLE 1-SOILS TYPES					
Map Unit	Map Unit Name	Hydro Soil Group	Drainage Class	K Factor Whole Soil	Hydric Rating
AsB	Annapolis fine sandy loam, 2 to 5 percent slopes	C	Well drained	0.24	0%
AsB	Annapolis fine sandy loam, 2 to 5 percent slopes	C	Well drained	0.24	Not-hydric
AsC	Annapolis fine sandy loam, 5 to 10 percent slopes	C	Well drained	0.24	0%
AuB	Annapolis-Urban land complex, 0 to 5 percent slopes	C	Well drained	0.24	0%
CkA	Colemantown fine sandy loam, 0 to 2 percent slopes	C/D	Poorly drained	0.17	95% Predominantly hydric
CnB	Colemantown-Urban land complex, 0 to 5 percent slopes	C/D	No rating	No rating	50% some hydric inclusions
CRD	Collington and Annapolis soils, 10 to 15 percent slopes	B	Well drained	0.17	0%
DnA	Donlonton fine sandy loam, 0 to 2 percent slopes	D	Mod well drained	0.24	5% Predominantly no-hydric
DnB	Donlonton fine sandy loam, 2 to 5 percent slopes	D	Mod well drained	0.24	5% Predominantly no-hydric
DuB	Donlonton-Urban land complex, 0 to 5 percent slopes	D	Mod well drained	0.24	5% Predominantly no-hydric
WBA	Widewater and Issue soils, 0 to 2 percent slopes, frequently flooded	C/D	Poorly drained	0.37	60% some hydric inclusions

b. *National Wetland Inventory Maps*

The National Wetland Inventory (NWI) Maps prepared by the U.S. Department of the Interior - Fish & Wildlife Service used high altitude aerial photography to map the limits of various wetland types³ throughout the United States. The NWI Map for this site (Figure 3) indicates the presence of one mapped wetland/waterway classification on the property: palustrine-forested, temporary flooded wetlands (PFO1A).

c. *USGS Topographic Maps*

The U.S. Geological Survey (USGS) Maps depict existing environmental features on sites, including 20-foot topographic lines, forest, structures, and roads, as well as the locations of ponds, intermittent and perennial streams. The USGS Map for this study area (Figure 4) does not indicate the presence of any mapped intermittent or perennial stream system on the property.

d. *Watershed Classification*

Section 26.08.01.08 of the Code of Maryland Regulations lists the stream segment designation for all the waterways within the state of Maryland, as well as their Use Classifications.

³ Cowardin, Lewis M., V. Carter, F.C. Golet, and E. T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Fish & Wildlife Service - Biological Services Program. FWS/OBS-79/31.

The entire study area drains into an unnamed tributary to Crab Creek, a Use I Waterway according to CoMar 26.08.02.08(K), a tributary of the South River. The site is not located within a Tier II watershed according to CoMar 26.08.02.04-1.

4. WETLAND DELINEATION PARAMETERS

In order for an area to be classified as a wetland, the following three parameters must exist: (a) a predominance of hydrophytic vegetation; (b) evidence of wetland hydrology; and (c) hydric soils. The data sheet in Appendix A summarizes the results of the field investigation.

a. *Hydrophytic Vegetation*

By definition, wetlands support a prevalence of vegetation typically adapted for life in saturated soil conditions under normal circumstances. Hydrophytic vegetation is present when the plant community is dominated by species that can tolerate prolonged inundation or soil saturation during the growing season. The wetland indicator status⁴ of the species that make up the plant community is used to determine whether hydrophytic vegetation is dominant. Plant species that are classified as Obligate (OBL), Facultative-wetland (FACW), or Facultative (FAC) are considered to be hydrophytic, while species classified as Facultative-Upland (FACU) and Upland (UPL) are considered to be non-wetland plants.

b. *Wetland Hydrology*

Wetlands by definition are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. The presence of water for an extended period of time at or within 12 inches of the soil surface is the driving force for all wetlands. The *Corps of Engineers Wetlands Delineation Manual* and the *Regional Supplement* list the indicators of wetland hydrology. The indicators are divided into two categories - primary and secondary. One primary indicator is sufficient to conclude that wetland hydrology is present. In the absence of a primary indicator, two or more secondary indicators are required to conclude that wetland hydrology is present.

c. *Hydric Soils*

A hydric soil is defined as a soil that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions, generally within 12 inches of the soil surface. Within the Coastal Plain of Maryland, hydric soil indicators are listed in the *Regional Supplement*. A sharpshooter shovel was used to collect soil samples.

5. SUMMARY OF FINDINGS

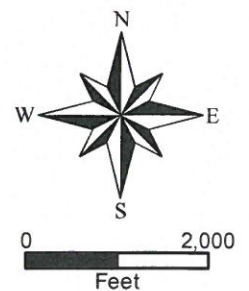
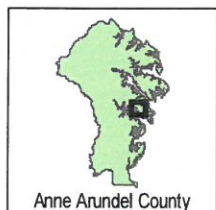
The delineation revealed that jurisdictional waters of the U.S. including non-tidal wetlands, exist within the study area as shown on the enclosed 40-scale *Wetland Delineation Plan* prepared by J.A. Chisholm Consulting Engineers. An intermittent stream (Photograph 9) originates in the southcentral portion of the property to the south of Mas Que Farm Road. The stream's primary hydrologic source is a man-made SWM Pond located on the opposite side of Mas Que Farm Road. Because this pond appears to have been constructed in an upland field based on a review of aerial photographs and environmental maps, it is our professional opinion that it should not be State or Federally regulated. From Mas Que Farm Road, the stream channel drains in a southerly direction into a large wetland system located outside of the study area. Wetland Delineation Data Sheets A and B and Photographs 1-4 document the non-tidal wetlands on the site. Wetland Delineation Data Sheets C and Photographs 5 and 6 document a typical upland area of the site.

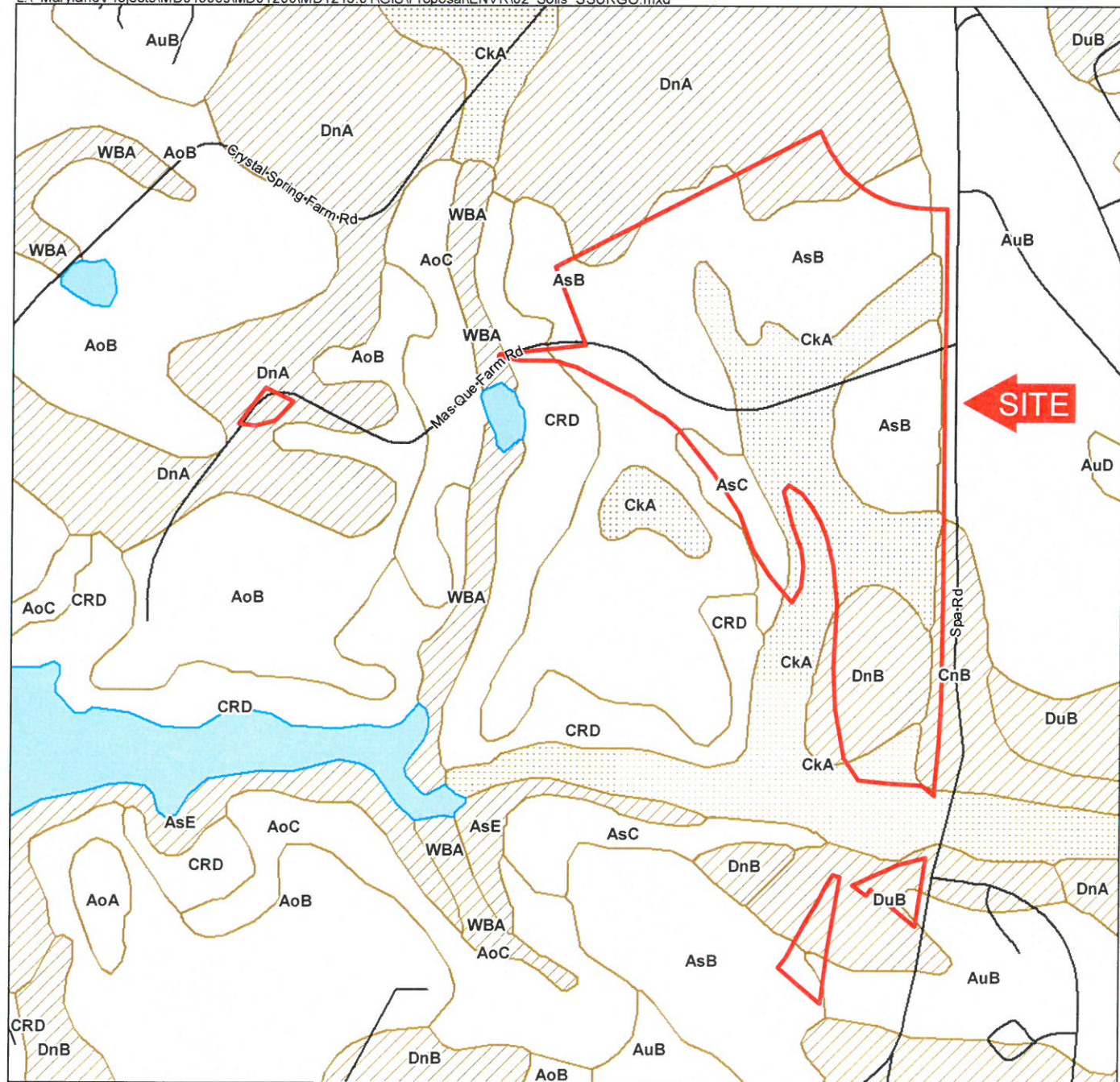
This determination cannot be considered complete until written confirmation is obtained from the U.S. Army Corps of Engineers and/or the Maryland Department of the Environment.



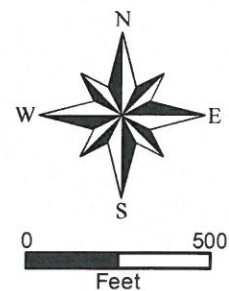
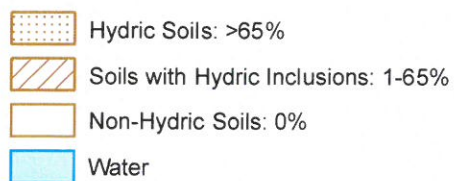
Copyright ADC The Map People
Permitted Use Number 20711184

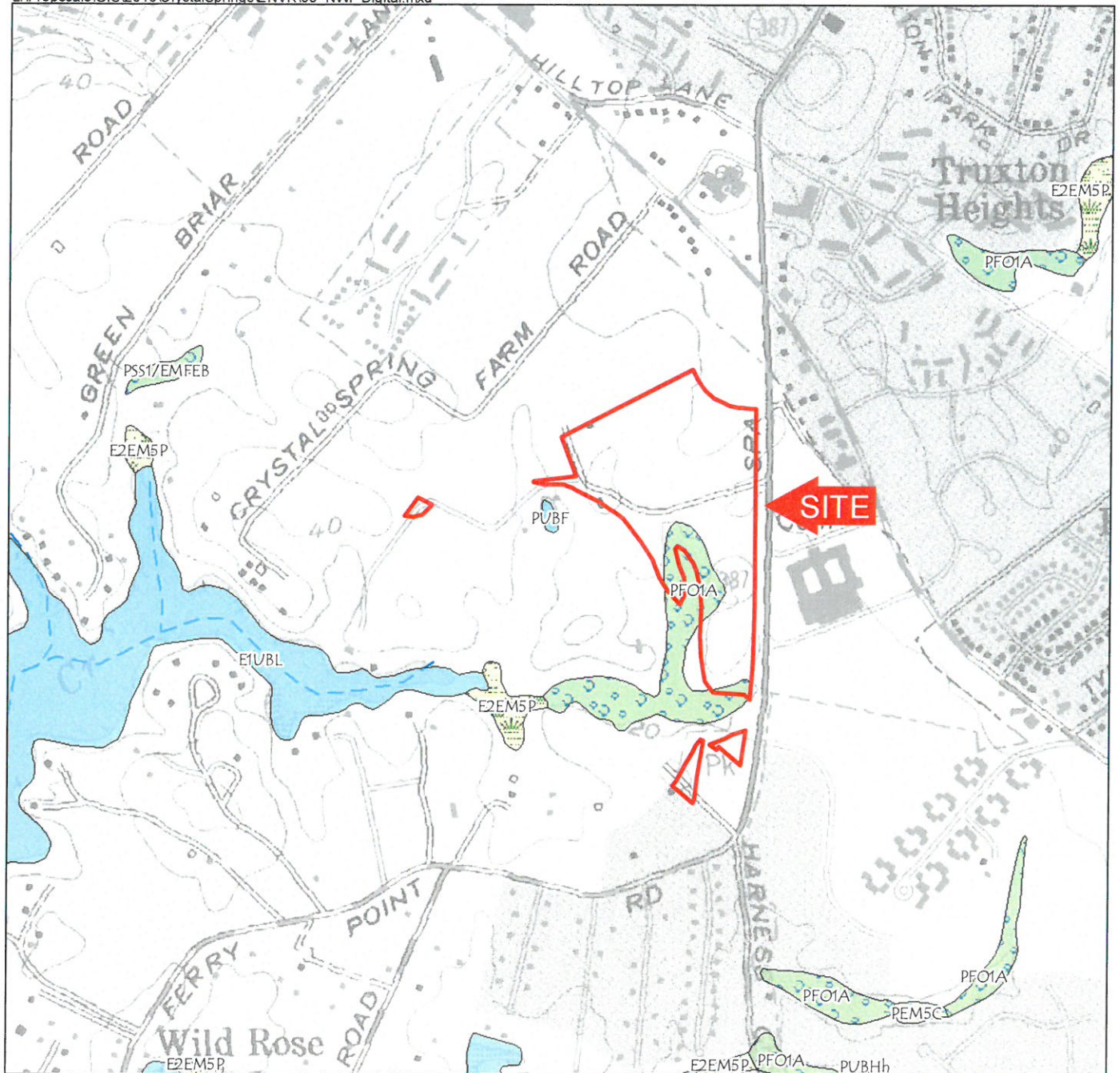
Vicinity Map
Crystal Springs
Original Scale: 1" = 2000'





Soils Map
SSURGO Digital Data
Crystal Springs
Original Scale: 1" = 500'



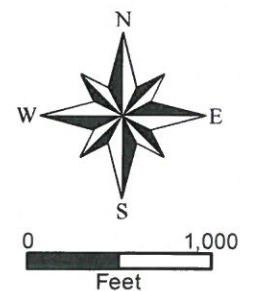


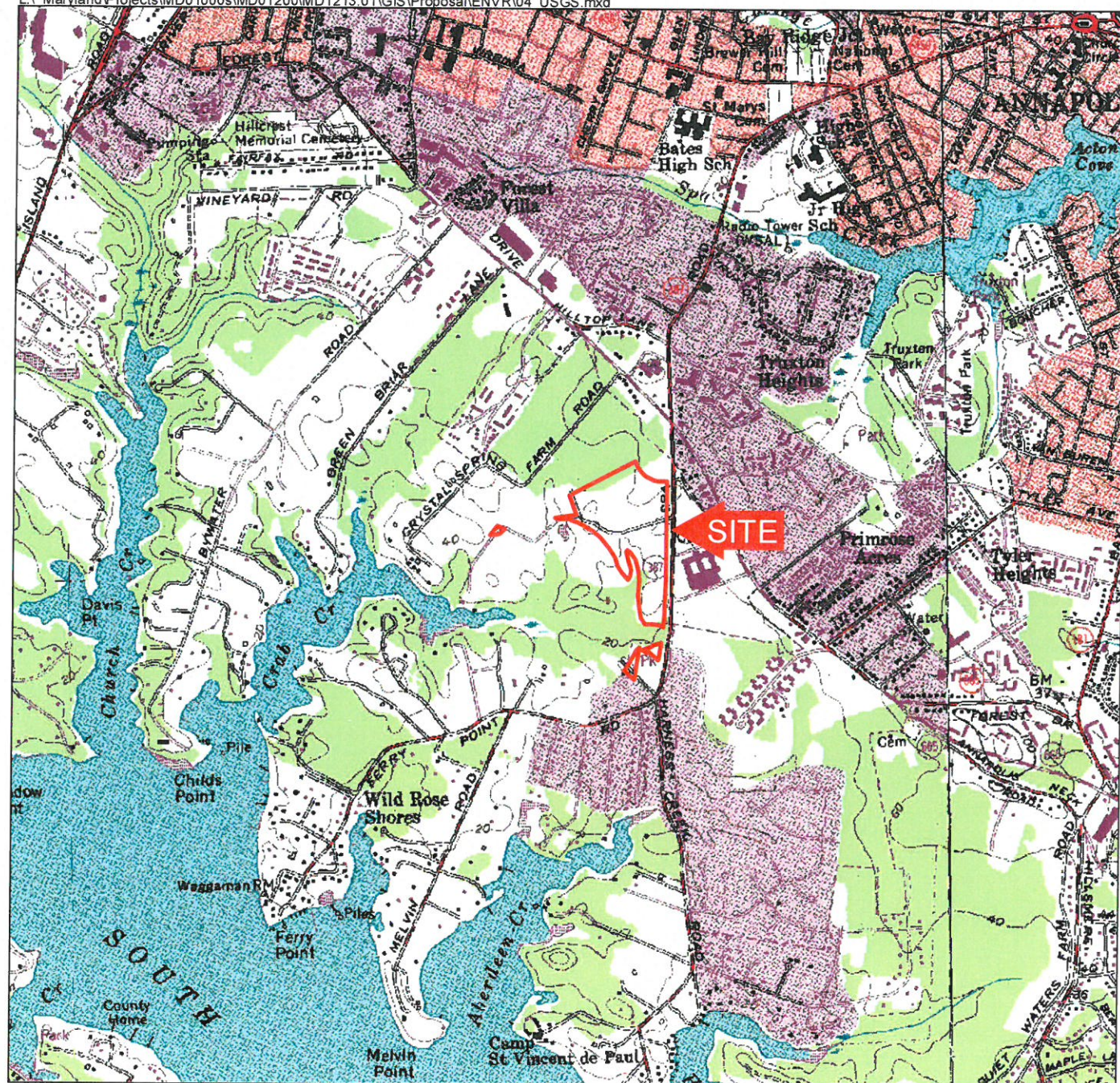
Digital National Wetlands Inventory Map
Crystal Springs
Original Scale: 1" = 1000'

Wetland Type

-  Open Water
-  Estuarine and Marine Wetland
-  Freshwater Emergent Wetland
-  Freshwater Forested/Shrub Wetland
-  Other Wetland

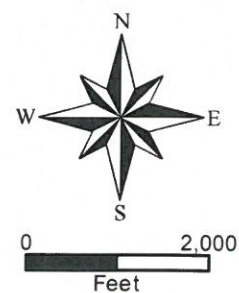
Download Date: September 2014
 Source: <http://www.fws.gov/wetlands/Data/State-Downloads.html>





**USGS Quad Map
South River, MD 1993
Crystal Springs
Original Scale: 1" = 2000'**

Latitude: 38°57'36" N
Longitude: 76°30'55" W
Hydrologic Unit Code (HUC): 020600040302
Name of Watershed: Beards Creek-South River
COE Region: Atlantic and Gulf Coastal Plain



APPENDIX A

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Crystal Spring City/County: Annapolis/Anne Arundel Sampling Date: 11/09/15
 Applicant/Owner: _____ State: MD Sampling Point: A
 Investigator(s): K. Wallis Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 2-5
 Subregion (LRR or MLRA): 149A Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: _____ NWI classification: PFO1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u> No _____		
Wetland Hydrology Present?	Yes <u>X</u> No _____		
Remarks:			

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Moss Trim Lines (B16)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> FAC-Neutral Test (D5)	
		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)	
Field Observations:			
Surface Water Present?	Yes _____ No <u>X</u> Depth (inches): _____	Wetland Hydrology Present? Yes <u>X</u> No _____	
Water Table Present?	Yes <u>X</u> No _____ Depth (inches): <u>surface</u>		
Saturation Present? (includes capillary fringe)	Yes <u>X</u> No _____ Depth (inches): <u>surface</u>		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			

VEGETATION (Four Strata) – Use scientific names of plants.

 Sampling Point: A

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Acer rubrum</u>	30	Y	Fac	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
2. <u>Ilex opaca</u>	10	Y	Fac	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
40 = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
50% of total cover: <u>20</u> 20% of total cover: <u>8</u>				
Sapling/Shrub Stratum (Plot size: _____)				
1. <u>Ilex opaca</u>	10	Y	Fac	
2. <u>Vaccinium corymbosum</u>	2	Y	FacW	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
10 = Total Cover				
50% of total cover: <u>5</u> 20% of total cover: <u>2</u>				
Herb Stratum (Plot size: _____)				
1. <u>Symplocarpus foetidus</u>	70	Y	Obl	Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
2. <u>Microstegium vimineum</u>	5	N	Fac	
3. <u>Viburnum nudum</u>	2	N	Obl	
4. <u>Smilax rotundifolia</u>	5	N	Fac	
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
82 = Total Cover				
50% of total cover: <u>41</u> 20% of total cover: <u>16.4</u>				
Woody Vine Stratum (Plot size: _____)				
1. <u>Smilax rotundifolia</u>	2	Y	Fac	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
2. _____				
3. _____				
4. _____				
5. _____				
2 = Total Cover				
50% of total cover: <u>1</u> 20% of total cover: <u>1</u>				
Remarks: (If observed, list morphological adaptations below).				

SOIL

Sampling Point: A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features		Type ¹	Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%				
0-4	10YR 3/2		10YR 5/3	20			loamy sand	
4-8	10YR 2/1						loam	
8-9	10YR 5/2		2.5Y 5/2				sand	
9-13	10YR 2/1		10RY 4/2				loamy sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5)
☐ Organic Bodies (A6) (LRR P, T, U)
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)
☐ Muck Presence (A8) (LRR U)
☐ 1 cm Muck (A9) (LRR P, T)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Coast Prairie Redox (A16) (MLRA 150A)
☐ Sandy Mucky Mineral (S1) (LRR O, S)
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Dark Surface (S7) (LRR P, S, T, U)

- ☐ Polyvalue Below Surface (S8) (LRR S, T, U)
☐ Thin Dark Surface (S9) (LRR S, T, U)
☐ Loamy Mucky Mineral (F1) (LRR O)
☒ Loamy Gleyed Matrix (F2)
☐ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Marl (F10) (LRR U)
☐ Depleted Ochric (F11) (MLRA 151)
☐ Iron-Manganese Masses (F12) (LRR O, P, T)
☐ Umbric Surface (F13) (LRR P, T, U)
☐ Delta Ochric (F17) (MLRA 151)
☐ Reduced Vertic (F18) (MLRA 150A, 150B)
☐ Piedmont Floodplain Soils (F19) (MLRA 149A)
☐ Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

Indicators for Problematic Hydric Soils³:

- ☐ 1 cm Muck (A9) (LRR O)
☐ 2 cm Muck (A10) (LRR S)
☐ Reduced Vertic (F18) (outside MLRA 150A,B)
☐ Piedmont Floodplain Soils (F19) (LRR P, S, T)
☐ Anomalous Bright Loamy Soils (F20)
 (MLRA 153B)
☐ Red Parent Material (TF2)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Crystal Spring City/County: Annapolis/Anne Arundel Sampling Date: 11/09/15
 Applicant/Owner: _____ State: MD Sampling Point: B
 Investigator(s): K. Wallis & A. Murtha Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 0-5
 Subregion (LRR or MLRA): 149A Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: _____ NWI classification: PFO1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u> No _____		
Wetland Hydrology Present?	Yes <u>X</u> No _____		
Remarks:			

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Marl Deposits (B15) (LRR U)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> FAC-Neutral Test (D5)
		<input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)

Field Observations:		Wetland Hydrology Present? Yes <u>X</u> No _____
Surface Water Present?	Yes _____ No <u>X</u> Depth (inches): _____	
Water Table Present?	Yes _____ No <u>X</u> Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes _____ No <u>X</u> Depth (inches): _____	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

 Sampling Point: B

<u>Tree Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			

_____ = Total Cover

50% of total cover: _____ 20% of total cover: _____

<u>Sapling/Shrub Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			

_____ = Total Cover

50% of total cover: _____ 20% of total cover: _____

<u>Herb Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. <i>Cinna arundinacea</i>	25	Y	FacW
2. <i>Juncus effusus</i>	7	N	FacW
3. <i>Onoclea sensibilis</i>	5	N	FacW
4. <i>Lonicera japonica</i>	5	N	FacU
5. <i>Dichanthelium clandestinum</i>	2	N	Fac
6. <i>Rosa multiflora</i>	2	N	FacU
7. <i>Sambucus canadense</i>	2	N	FacW
8. <i>Lycopus virginicus</i>	2	N	Obl
9. <i>Elaeagnus angustifolia</i>	1	N	FacU
10. <i>Solanum</i> sp.	1	N	--
11. _____			
12. _____			

52 = Total Cover

50% of total cover: 26 20% of total cover: 10.4

<u>Woody Vine Stratum</u> (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2. _____			
3. _____			
4. _____			
5. _____			

_____ = Total Cover

50% of total cover: _____ 20% of total cover: _____

Remarks: (If observed, list morphological adaptations below).

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

Yes X No _____

SOIL

Sampling Point: B**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features			Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹		
0-3	10YR 3/2		5YR 3/4	5		sandy loam	
3-12	5Y 4/2		2.5YR 4/6	30		fine sandy loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- | | |
|--|---|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR S, T, U) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Thin Dark Surface (S9) (LRR S, T, U) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR O) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> Stratified Layers (A5) | <input checked="" type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Organic Bodies (A6) (LRR P, T, U) | <input type="checkbox"/> Redox Dark Surface (F6) |
| <input type="checkbox"/> 5 cm Mucky Mineral (A7) (LRR P, T, U) | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Muck Presence (A8) (LRR U) | <input type="checkbox"/> Redox Depressions (F8) |
| <input type="checkbox"/> 1 cm Muck (A9) (LRR P, T) | <input type="checkbox"/> Marl (F10) (LRR U) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Ochric (F11) (MLRA 151) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR O, P, T) |
| <input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 150A) | <input type="checkbox"/> Umbric Surface (F13) (LRR P, T, U) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR O, S) | <input type="checkbox"/> Delta Ochric (F17) (MLRA 151) |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Reduced Vertic (F18) (MLRA 150A, 150B) |
| <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149A) |
| <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D) |
| <input type="checkbox"/> Dark Surface (S7) (LRR P, S, T, U) | |

Indicators for Problematic Hydric Soils³:

- ☐ 1 cm Muck (A9) (LRR O)
☐ 2 cm Muck (A10) (LRR S)
☐ Reduced Vertic (F18) (outside MLRA 150A,B)
☐ Piedmont Floodplain Soils (F19) (LRR P, S, T)
☐ Anomalous Bright Loamy Soils (F20)
(MLRA 153B)
☐ Red Parent Material (TF2)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Crystal Spring City/County: Annapolis/Anne Arundel Sampling Date: 11/09/15
 Applicant/Owner: _____ State: MD Sampling Point: C
 Investigator(s): K. Wallis & A. Murtha Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): shallow swale Local relief (concave, convex, none): concave Slope (%): 0-5
 Subregion (LRR or MLRA): 149A Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: _____ NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes _____ No <u>X</u>	
Remarks:	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Marl Deposits (B15) (LRR U) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)		Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Sphagnum moss (D8) (LRR T, U)
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes _____ No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION (Four Strata) – Use scientific names of plants.

 Sampling Point: C

<u>Tree Stratum</u> (Plot size: _____)			
	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Liquidambar styraciflua</u>	60	Y	Fac
2. <u>Quercus falcata</u>	20	Y	FacU
3. <u>Acer rubrum</u>	15	N	Fac
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____

95 = Total Cover

 50% of total cover: 47.5 20% of total cover: 19

<u>Sapling/Shrub Stratum</u> (Plot size: _____)			
1. <u>Berberis thunbergii</u>	10	Y	FacU
2. <u>Liquidambar styraciflua</u>	10	Y	Fac
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____

20 = Total Cover

 50% of total cover: 10 20% of total cover: 4

<u>Herb Stratum</u> (Plot size: _____)			
1. <u>Lonicera japonica</u>	20	Y	FacU
2. <u>Dichanthelium clandestinum</u>	10	Y	Fac
3. <u>Rubus allegheniensis</u>	10	Y	FacU
4. <u>Alliaria petiolata</u>	10	Y	FacU
5. <u>Juncus effusus</u>	5	N	FacW
6. <u>Ilex opaca</u>	5	N	Fac
7. <u>Cinna arundinacea</u>	5	N	FacW
8. <u>Solidago sp.</u>	5	N	--
9. <u>Allium vineale</u>	2	N	FacU
10. <u>Oplismenus hirtellus</u>	2	N	FacU
11. <u>Campsis radicans</u>	1	N	Fac
12. _____	_____	_____	_____

75 = Total Cover

 50% of total cover: 37.5 20% of total cover: 22.5

<u>Woody Vine Stratum</u> (Plot size: _____)			
1. <u>Vitis labrusca</u>	5	Y	FacU
2. <u>Toxicodendron radicans</u>	5	Y	Fac
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____

10 = Total Cover

 50% of total cover: 5 20% of total cover: 2
Dominance Test worksheet:

 Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

 Total Number of Dominant Species Across All Strata: 10 (B)

 Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

 ___ 3 - Prevalence Index is ≤3.0¹

 ___ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:
Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

 Yes _____ No X

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: C**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 3/3						loam	
4-9	5Y 4/3						loam	
9-13	10YR 5/6		2.5Y 4/2				sandy loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5)
☐ Organic Bodies (A6) (LRR P, T, U)
☐ 5 cm Mucky Mineral (A7) (LRR P, T, U)
☐ Muck Presence (A8) (LRR U)
☐ 1 cm Muck (A9) (LRR P, T)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Coast Prairie Redox (A16) (MLRA 150A)
☐ Sandy Mucky Mineral (S1) (LRR O, S)
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Dark Surface (S7) (LRR P, S, T, U)

- ☐ Polyvalue Below Surface (S8) (LRR S, T, U)
☐ Thin Dark Surface (S9) (LRR S, T, U)
☐ Loamy Mucky Mineral (F1) (LRR O)
☐ Loamy Gleyed Matrix (F2)
☐ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Marl (F10) (LRR U)
☐ Depleted Ochric (F11) (MLRA 151)
☐ Iron-Manganese Masses (F12) (LRR O, P, T)
☐ Umbric Surface (F13) (LRR P, T, U)
☐ Delta Ochric (F17) (MLRA 151)
☐ Reduced Vertic (F18) (MLRA 150A, 150B)
☐ Piedmont Floodplain Soils (F19) (MLRA 149A)
☐ Anomalous Bright Loamy Soils (F20) (MLRA 149A, 153C, 153D)

Indicators for Problematic Hydric Soils³:

- ☐ 1 cm Muck (A9) (LRR O)
☐ 2 cm Muck (A10) (LRR S)
☐ Reduced Vertic (F18) (outside MLRA 150A,B)
☐ Piedmont Floodplain Soils (F19) (LRR P, S, T)
☐ Anomalous Bright Loamy Soils (F20)
 (MLRA 153B)
☐ Red Parent Material (TF2)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

APPENDIX B

Photograph 1 – 11/09/15
(View of soil profile at Wetland Delineation Data Point A)



Photograph 2 – 11/09/15
(View of vegetation at Wetland Delineation Data Point A)



Photograph 3 – 11/09/15
(View of soil profile at Wetland Delineation Data Point B)



Photograph 4 – 11/09/15
(View of vegetation at Wetland Delineation Data Point B)



Photograph 5 – 11/09/15
(View of soil profile at Wetland Delineation Data Point C)



Photograph 6 – 11/09/15
(View of vegetation at Wetland Delineation Data Point C)



Photograph 7 – 11/09/15
(Shallow swale/drive aisle on the horse farm.)



Photograph 8 – 11/09/15
(SWM pond located on the horse farm from Mas Que Farm Road.)



Photograph 9 – 11/09/15
(Head of intermittent stream channel to the south of Mas Que Farm Road.)

